Claims

1. A method comprising converting a treated biomass feedstock to a product selected from the group consisting of alcohols, organic acids, sugars, hydrocarbons, and mixtures thereof, utilizing an enzyme and/or a microorganism, wherein the treated biomass feedstock has been prepared by irradiating a biomass feedstock with an electron beam at a dose rate of at least 1.0 Mrad/s for a time sufficient to deliver from about 10 Mrad to about 150 Mrad of radiation to the biomass feedstock so as to render the irradiated biomass feedstock more susceptible to chemical, enzymatic and/or biological attack than the biomass feedstock prior to electron beam treatment, the biomass feedstock having been physically treated prior to electron beam irradiation by grinding, milling or shearing.

2. The method of claim 1 wherein the biomass feedstock has a bulk density of less than about ~~0.5 g/cm3.~~

3. The method of claim 1 wherein the initial feedstock has, prior to physical treatment, a bulk density of greater than about ~~0.7 g/cm3.~~

4. The method of claim 1 wherein physically treating the biomass feedstock comprises reducing the size of the initial feedstock by stone grinding, mechanical ripping or tearing, pin grinding, or air attrition milling.

5. The method of claim 1 wherein physically treating the biomass feedstock comprises shearing the biomass feedstock.

6. The method of claim 5 wherein the biomass feedstock has internal fibers, and wherein the biomass feedstock has been sheared to an extent that its internal fibers are substantially exposed.

7. The method of claim 1 wherein the biomass feedstock comprises a cellulosic or lignocellulosic material.

8. The method of claim 1 wherein treating the biomass feedstock is conducted under conditions selected to result in a reduction of the molecular weight of the biomass.

9. The method of claim 1 wherein the biomass has a BET surface area of greater than 0.25 ~~m2/g.~~

10. The method of claim 1 wherein the biomass has a length to diameter ratio of at least 5.

11. The method of claim 1 wherein converting the treated biomass feedstock comprises fermenting the treated biomass feedstock.

Claims

1. A method comprising converting a treated biomass feedstock to a product selected from the group consisting of alcohols, organic acids, sugars, hydrocarbons, and mixtures thereof, utilizing an enzyme and/or a microorganism, wherein the treated biomass feedstock has been prepared by irradiating a biomass feedstock with an electron beam at a dose rate of at least 1.0 Mrad/s for a time sufficient to deliver from about 10 Mrad to about 150 Mrad of radiation to the biomass feedstock so as to render the irradiated biomass feedstock more susceptible to chemical, enzymatic and/or biological attack than the biomass feedstock prior to electron beam treatment, the biomass feedstock having been physically treated prior to electron beam irradiation by grinding, milling or shearing.

2. The method of claim 1 wherein the biomass feedstock has a bulk density of less than about 0.5 g/cm^3.

3. The method of claim 1 wherein the initial feedstock has, prior to physical treatment, a bulk density of greater than about 0.7 g/cm^3.

4. The method of claim 1 wherein physically treating the biomass feedstock comprises reducing the size of the initial feedstock by stone grinding, mechanical ripping or tearing, pin grinding, or air attrition milling.

5. The method of claim 1 wherein physically treating the biomass feedstock comprises shearing the biomass feedstock.

6. The method of claim 5 wherein the biomass feedstock has internal fibers, and wherein the biomass feedstock has been sheared to an extent that its internal fibers are substantially exposed.

7. The method of claim 1 wherein the biomass feedstock comprises a cellulosic or lignocellulosic material.

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9. The method of claim 1 wherein the biomass has a BET surface area of greater than 0.25 m^2/g.

10. The method of claim 1 wherein the biomass has a length to diameter ratio of at least 5.

11. The method of claim 1 wherein converting the treated biomass feedstock comprises fermenting the treated biomass feedstock.